



# NORTHERN HARDWOOD NOTES

## Regenerating Eastern Hemlock In The Lake States

The eastern hemlock type is declining in area faster than any other. Growing-stock volume, for example, declined 71 percent in only 20 years in Michigan, and has declined similarly in Wisconsin. Many land management agencies have stopped cutting hemlock until satisfactory regeneration can be assured.

### Why Hemlock is Hard to Regenerate

1. The thick mat of mor humus that builds up under long-lived species prevents hemlock (and even germinating sugar maple seedlings) from penetrating to mineral soil.
2. Even though hemlock produces cones 3 years out of 5, only about 2 seeds out of a possible 12 are potentially viable.
3. Hemlock seeds take twice as long to germinate as associated species and need higher temperatures (optimum is 59° F) than earlier findings indicated.
4. Hemlock seeds must land on seedbeds that are free of herbs and composed of shallowly mixed humus and mineral soil that retain moisture a long time. This is necessary because of hemlock's low growth vigor and shallow rooting habit.
5. Hemlock seedbeds need shade (70 to 80 percent crown cover) to inhibit competition from herbaceous growth and other tree species, and to prevent seedling dessication.
6. Damping off kills many hemlock seedlings. No natural control measures are known.
7. Hemlock seedlings grow more slowly than associated species, even under optimum conditions, so it takes a long time for hemlock regeneration to dominate the new stand.
8. Seed insects damage 2 to 42 percent of the seeds. Rodents and smothering by litter also take a toll.

### Four Treatments to Obtain Hemlock

Despite these problems the following treatments have been successful:

1. Lightly scarify to mix the humus and upper mineral soil on at least 60 percent of the area. This seedbed holds surface soil moisture, raises and extends the temperature required for germination, and provides a good medium for rooting.
2. Cut from below all low-level trees leaving 70 to 80 percent of the canopy.
3. If natural seeding is inadequate, supplement with artificial seeding at the rate of one-third to two-thirds pound per acre.
4. When hemlock regeneration is 2 to 4 feet high, remove the residual overstory during winter.

You should start regeneration cuttings before 10 percent of the hemlock trees have begun to die, otherwise they will likely be replaced by less desirable hardwoods. By extending site preparation beyond the hemlock type boundaries into neighboring hardwood types, you can sometimes enlarge the area of hemlock. At the least you will be reducing the competition of hardwoods on the boundaries.

Prescribed burning is a good substitute for scarification. It is cheaper, may help control seed and cone insects, and increases nutrient levels.

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